

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Canceled) A proton conducting membrane which is formed by crosslinking a unit structure of a layered clay mineral, wherein a polyvalent metal ion, which does not naturally exist in said layered clay mineral, is incorporated between layers of said layered clay mineral.
2. (Currently Amended) ~~The proton conducting membrane according to claim 1~~A proton conducting membrane which is formed by crosslinking a unit structure of a layered clay mineral, wherein a polyvalent metal ion is incorporated between layers of said layered clay mineral, and wherein the unit structure of the layered clay mineral is crosslinked with a tetrafunctional alkoxide or a trifunctional alkoxide.
3. (Previously Presented) The proton conducting membrane according to claim 2, wherein the crosslinking tetrafunctional alkoxide or trifunctional alkoxide incorporates a strong acid group.
4. (Currently Amended) ~~The proton conducting membrane according to claim 1~~A proton conducting membrane which is formed by crosslinking a unit structure of a layered clay mineral, wherein a polyvalent metal ion is incorporated between layers of said layered clay mineral, and wherein a cationic surfactant is incorporated between layers of the layered clay mineral.

5. (Currently Amended) ~~The proton conducting membrane according to~~
~~claim 1~~A proton conducting membrane which is formed by crosslinking a unit structure
of a layered clay mineral, wherein a polyvalent metal ion is incorporated between layers
of said layered clay mineral, and wherein the unit structure of the layered clay mineral is
crosslinked with an alkoxide having a functional group.

6. (Currently Amended) ~~The proton conducting membrane according to~~
~~claim 1~~A proton conducting membrane which is formed by crosslinking a unit structure
of a layered clay mineral, wherein a polyvalent metal ion is incorporated between layers
of said layered clay mineral, and wherein the unit structure of the layered clay mineral is
crosslinked with bis-alkoxysilane.

7. (Currently Amended) ~~The proton conducting membrane according to~~
~~claim 1~~A proton conducting membrane which is formed by crosslinking a unit structure
of a layered clay mineral, wherein a polyvalent metal ion is incorporated between layers
of said layered clay mineral, and wherein the unit structure of the layered clay mineral is
crosslinked with an alkoxysilane having an epoxy ring.

8. (Previously Presented) A method for producing a proton conducting
membrane which comprises the steps of: adding water to a layered clay mineral for
obtaining a dispersed solution; adding a crosslinking agent to the dispersed solution for
obtaining a developing liquid; developing the developing liquid on the substrate for

obtaining a developing layer; heating and drying the developing layer for obtaining a membrane; and immersing the membrane in an aqueous solution containing polyvalent ions, and drying.

9. (Canceled)

10. (Original) A method for producing a proton conducting membrane which comprises the steps of: producing a proton conducting material according to the method according to claim 8; dissolving or dispersing the proton conducting material for preparing a solution or a sol; and gelating by the removal of solvent from the solution or sol.

11. (Currently Amended) A solid polymer fuel cell comprising a membrane electrode assembly (MEA) which comprises (a) a polymer solid electrolyte membrane; and (b) a gas diffusion electrode, which electrode couples with the electrolyte membrane and has as a main constituent material an electrode catalyst which comprises a conductive carrier that supports a catalytic metal and a proton conducting membrane, wherein the polymer solid electrolyte membrane and/or the proton conducting membrane is the proton conducting membrane according to claim 42.

12. (New) A solid polymer fuel cell comprising a membrane electrode assembly (MEA) which comprises (a) a polymer solid electrolyte membrane; and (b) a gas diffusion electrode, which electrode couples with the electrolyte membrane and has

as a main constituent material an electrode catalyst which comprises a conductive carrier that supports a catalytic metal and a proton conducting membrane, wherein the polymer solid electrolyte membrane and/or the proton conducting membrane is the proton conducting membrane according to claim 4.

13. (New) A solid polymer fuel cell comprising a membrane electrode assembly (MEA) which comprises (a) a polymer solid electrolyte membrane; and (b) a gas diffusion electrode, which electrode couples with the electrolyte membrane and has as a main constituent material an electrode catalyst which comprises a conductive carrier that supports a catalytic metal and a proton conducting membrane, wherein the polymer solid electrolyte membrane and/or the proton conducting membrane is the proton conducting membrane according to claim 5.

14. (New) A solid polymer fuel cell comprising a membrane electrode assembly (MEA) which comprises (a) a polymer solid electrolyte membrane; and (b) a gas diffusion electrode, which electrode couples with the electrolyte membrane and has as a main constituent material an electrode catalyst which comprises a conductive carrier that supports a catalytic metal and a proton conducting membrane, wherein the polymer solid electrolyte membrane and/or the proton conducting membrane is the proton conducting membrane according to claim 6.

15. (New) A solid polymer fuel cell comprising a membrane electrode assembly (MEA) which comprises (a) a polymer solid electrolyte membrane; and (b) a

gas diffusion electrode, which electrode couples with the electrolyte membrane and has as a main constituent material an electrode catalyst which comprises a conductive carrier that supports a catalytic metal and a proton conducting membrane, wherein the polymer solid electrolyte membrane and/or the proton conducting membrane is the proton conducting membrane according to claim 7.